

IN THE CLAIMS:

The following is a complete listing of the claims in this application, reflects all changes currently being made to the claims, and replaces all earlier versions and all earlier listings of the claims:

Claim 1. (Currently Amended) A photoelectric conversion device comprising:

a plurality of photoelectric conversion regions each having a first semiconductor region for accumulating electric charges that correspond to incident light; and
a plurality of amplifying field effect transistors into which a signal charge from said photoelectric conversion regions is inputted, wherein:

each ~~photoelectric conversion region~~ first semiconductor region is surrounded by a potential barrier region,

a nick region is formed in a part of said potential barrier region, and

~~one of main electrode regions~~ a source or drain region of each field effect transistor is placed adjacent to said nick region, said ~~main electrode region~~ source or drain region having the same conductivity type as said first semiconductor region.

Claim 2. (Previously Presented) A photoelectric conversion device according to claim 1, wherein said potential barrier region includes at least a selectively oxidized film and a channel stopping layer directly below said selectively oxidized film.

Claim 3. (Currently Amended) A photoelectric conversion device according to

claim 1, wherein said potential barrier region includes at least a buried isolation region whose conductivity type is opposite to that of said ~~photoelectric conversion regions~~ first semiconductor regions.

Claim 4. (Currently Amended) A photoelectric conversion device according to claim 1, wherein each ~~photoelectric conversion region~~ first semiconductor region is formed in a low impurity concentration region that is doped with an impurity of the same conductivity type as said ~~photoelectric conversion regions~~ first semiconductor regions in a concentration lower than the impurity concentration of said ~~photoelectric conversion regions~~ first semiconductor regions.

Claim 5. (Currently Amended) A photoelectric conversion device according to claim 4, wherein a buried isolation region whose conductivity type is opposite to the conductivity type of said ~~photoelectric conversion regions~~ first semiconductor regions is formed below each field effect transistor.

Claim 6. (Currently Amended) A photoelectric conversion device according to claim 5,

wherein said buried isolation region placed below each field effect transistor surrounds a region larger than each ~~photoelectric conversion region~~ first semiconductor region, and

wherein the region surrounded by the buried isolation region functions as a photosensitive region.

Claim 7. (Canceled)

Claim 8. (Currently Amended) A photoelectric conversion device according to claim 5, wherein said buried isolation region is ~~[[not]]~~ placed at least a part in an area below said one main electrode region of each field effect transistor, ~~at least, a part of the area.~~

Claim 9. (Currently Amended) A photoelectric conversion device according to claim 1,

wherein said potential barrier region includes at least a semiconductor region whose conductivity type is opposite to the conductivity type of said ~~photoelectric conversion regions~~ first semiconductor regions, and

wherein a buried region that is doped with an impurity of the same conductivity type as said semiconductor region in a concentration lower than the impurity concentration of said semiconductor region is placed in said nick region.

Claim 10. (Original) A photoelectric conversion device according to claim 4, wherein the low impurity concentration region is one of a semiconductor substrate, an epitaxial layer, and a well.

Claim 11. (Previously Presented) A photoelectric conversion device according to claim 1, wherein said one main electrode region is connected to a fixed electric potential or a similar electric potential.

Claim 12. (Currently Amended) A photoelectric conversion device according to claim 1, wherein a semiconductor region whose conductivity type is opposite to the conductivity type of said photoelectric conversion regions is placed below said ~~photoelectric conversion regions~~ first semiconductor regions.

Claim 13. (Previously Presented) An image pick-up system, comprising:
a photoelectric conversion device according to claim 1;
an optical system for forming an image in said photoelectric conversion device;
and
a signal processing circuit for processing a signal outputted from said photoelectric conversion device.

Claim 14. (Currently Amended) A photoelectric conversion device comprising:
a plurality of photoelectric conversion regions each having a first semiconductor region for accumulating electric charges that correspond to incident light; and
a plurality of amplifying field effect transistors into which a signal charge from the photoelectric conversion regions is inputted; and
a second semiconductor region connected to a gate of each amplifying field effect transistor wherein:
a potential barrier region surrounds each photoelectric conversion region;
a low potential barrier region is formed in a part of said potential barrier region and has a potential lower than a potential of the other part of said potential barrier region;

a transfer region transfers the signal charges in each of the first semiconductor regions to the second semiconductor regions; and

~~one of main electrode regions~~ a source or drain region of each field effect transistor is placed adjacent to said low potential barrier region, said ~~main electrode region~~ source or drain region having the same conductivity type as said first semiconductor region.

Claim 15. (Previously Presented) A photoelectric conversion device according to claim 14, wherein said potential barrier region includes at least a selectively oxidized film and a channel stopping layer directly below said selectively oxidized film.

Claim 16. (Currently Amended) A photoelectric conversion device according to claim 14, wherein said potential barrier region includes at least a buried isolation region whose conductivity type is opposite to that of said ~~photoelectric conversion regions~~ first semiconductor regions.

Claim 17. (Currently Amended) A photoelectric conversion device according to claim 14, wherein each ~~photoelectric conversion region~~ first semiconductor region is formed in a low impurity concentration region that is doped with an impurity of the same conductivity type as said ~~photoelectric conversion regions~~ first semiconductor regions in a concentration lower than the impurity concentration of said ~~photoelectric conversion regions~~ first semiconductor regions.

Claim 18. (Currently Amended) A photoelectric conversion device according to

claim 17, wherein a buried isolation region whose conductivity type is opposite to the conductivity type of said ~~photoelectric conversion regions~~ first semiconductor regions is formed below each field effect transistor.

Claim 19. (Currently Amended) A photoelectric conversion device according to claim 18,

wherein said buried isolation region placed below each field effect transistor surrounds a region larger than each ~~photoelectric conversion region~~ first semiconductor region, and

wherein the region surrounded by the buried isolation region functions as a photosensitive region.

Claim 20. (Canceled)

Claim 21. (Currently Amended) A photoelectric conversion device according to claim 18, wherein said buried isolation region is ~~[[not]]~~ placed at least a part in an area below said one main electrode region of said field effect transistor, ~~at least, a part of the area.~~

Claim 22. (Currently Amended) A photoelectric conversion device according to claim 14,

wherein said potential barrier region includes at least a semiconductor region whose conductivity type is opposite to the conductivity type of said ~~photoelectric conversion~~

~~regions~~ first semiconductor regions, and

wherein a buried region that is doped with an impurity of the same conductivity type as said semiconductor region in a concentration lower than the impurity concentration of said semiconductor region is placed in a nick region.

Claim 23. (Original) A photoelectric conversion device according to claim 17, wherein the low impurity concentration region is one of a semiconductor substrate, an epitaxial layer, and a well.

Claim 24. (Previously Presented) A photoelectric conversion device according to claim 14, wherein said one main electrode region is connected to a fixed electric potential or a similar electric potential.

Claim 25. (Currently Amended) A photoelectric conversion device according to claim 14, wherein a semiconductor region whose conductivity type is opposite to the conductivity type of said ~~photoelectric conversion regions~~ first semiconductor regions is placed below said ~~photoelectric conversion regions~~ first semiconductor regions.

Claim 26. (Previously Presented) An image pick-up system, comprising:

a photoelectric conversion device according to claim 14;

an optical system for forming an image in said photoelectric conversion device;

and

a signal processing circuit for processing a signal outputted from said photoelectric conversion device.